Quantitative Verification in Practice

Boudewijn R. Haverkort[1,2], Joost-Pieter Katoen[2,3], and Kim G. Larsen[4]

[1] Embedded Systems Institute, Eindhoven, The Netherlands
[2] University of Twente, Formal Methods and Tools, The Netherlands
[3] RWTH Aachen University, Software Modeling and Verification Group, Germany
[4] Center for Embedded Software Systems, Aalborg, Denmark

Abstract. Soon after the birth of model checking, the first theoretical achievements have been reported on the automated verification of quantitative system aspects such as discrete probabilities and continuous time. These theories have been extended in various dimensions, such as continuous probabilities, cost constraints, discounting, hybrid phenomena, and combinations thereof. Due to unremitting improvements of underlying algorithms and data structures, together with the availability of more advanced computing engines, these techniques are nowadays applicable to realistic designs. Powerful software tools allow these techniques to be applied by non-specialists, and efforts have been made to embed these techniques into industrial system design processes. Quantitative verification has a broad application potential — successful applications in embedded system design, hardware, security, safety-critical software, schedulability analysis, and systems biology exemplify this. It is fair to say, that over the years this application area grows rapidly and there is no sign that this will not continue. This session reports on applying state-of-the-art quantitative verification techniques and tools to a variety of industrial case studies.

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